CASIO BF-80

INSTRUCTION MANUAL
MANUAL DE INSTRUCCION

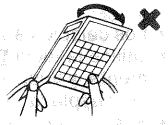
MO11027016B Printed in Japan

English

Thank you very much for your selection of the Casio BF-80 calculator. In order to ensure proper operation of this marvel of electronics engineering, be sure to carefully read this manual and follow the instructions contained herein. Keep this manual on hand for later reference.

PRECAUTIONS

- This unit is constructed of precision electronic components and therefore should not be exposed to temperature extremes, sudden temperature changes, bending, twisting, or strong impacts.
- The battery should be removed from the unit if it becomes exhausted. Be sure to replace the battery every two years regardless of how much it is used to avoid the chance of malfunctions due to battery leakage. Never allow batteries to be incinerated.
- Note that the manufacturer assumes no responsibility for any loss or claims by third parties which may arise through the use of this unit.
- Note that the manufacturer assumes no responsibility for any damages incurred as a result of data loss caused by malfunctions, repairs or battery replacements. Physical records of important data should be prepared to protect against such data losses.
- Always perform calculations by pressing the correct keys while monitoring results on the display.
- Never bend the unit in the opposite direction as shown right. This could split the case, or break internal circuitry.

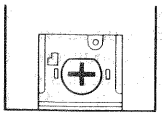


BATTERY REPLACEMENT

Note that either battery replacement or the reset operation will erase all data stored in the unit. Important data should be copied down on paper in advance of these operations.

- This unit is powered by one lithium battery (CR2016).
- The following procedure should be performed when the display of the unit becomes difficult to read:

① Press the OFF key to turn the power of the unit OFF.
② Remove the battery compartment cover on the back of the unit after loosening the screw holding it in place.
③ Remove the old battery.
④ Press the reset button (RESET) on the front of the unit with a thin, pointed object for at least 4 seconds.
⑤ Wipe the surface of a new battery with a soft, dry cloth and load it into the compartment so that the positive pole (+) is facing upwards.
⑥ Replace the battery compartment cover and replace the screw while pressing down on the battery.
⑦ Press the AC key to turn power ON and then press the reset button again. Note that this operation will erase all data stored in the unit.



* If the operation in step ⑦ does not cause "0." to appear on the display, repeat steps ① through ⑦.

IMPORTANT: Keep batteries away from small children. Contact a physician immediately if inadvertently swallowed.

AUTO POWER OFF FUNCTION

- The unit switches off automatically if approximately 6 minutes elapse after the last key operation. Press the AC key to restore power switched off by this function.
- The data present in memory is retained unless the battery is exhausted or removed.

FINANCIAL CALCULATIONS

1. Principal + interest calculations

Example 1: Principal: $5000
Interest: 6%, compounded annually
Period: 7 years
Object: Principal + interest

OPERATION	DISPLAY	
CMPD FV	PV ? CMPD 0.	Previous financial calculation data appears in place of "0." when present. The same is true for following operations when ENTER is pressed.
(Principal) 5000	PV ? CMPD 5000.	
ENTER	i% ? CMPD 0.	
(Annual interest) 6	i% ? CMPD 6.	
ENTER	n ? CMPD 0.	
(Number of years) 7	n ? CMPD 7.	
ENTER	FV= CMPD 7518.1512	Total principal + interest = $7,518.1512
INT	INT= CMPD 2518.1512	Interest = $2,518.1512

Example 2: Find the total principal + interest for the previous example when interest is compounded biannually.

OPERATION	DISPLAY	
CMPD FV	PV ? CMPD 0.	Previous financial calculation data appears in place of "0." when present. The same is true for following operations when ENTER is pressed.
5000	PV ? CMPD 5000.	
ENTER	i% ? CMPD 0.	
6 ÷ 2 = * Divide the annual interest rate by 2 to compound biannually.	i% ? CMPD 3.	
ENTER	n ? CMPD 0.	
7 × 2 = * Multiply the number of periods by 2.	n ? CMPD 14.	
ENTER	FV= CMPD 7562.9486	
INT	INT= CMPD 2562.9486	

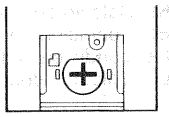
2. Principal of compound interest calculation

Example: Interest: 4%, compounded quarterly
Period: 2 years
Target: $15,000
Object: Required principal

OPERATION	DISPLAY	
CMPD FV	FV ? CMPD 0.	Previous financial calculation data appears in place of "0." when present. The same is true for following operations when ENTER is pressed.
15000	FV ? CMPD 15000.	
ENTER	i% ? CMPD 0.	
4 ÷ 4 = * Divide the annual interest rate by 4 to compound quarterly.	i% ? CMPD 1.	
ENTER	n ? CMPD 0.	
2 × 4 = * Multiply the number of periods by 4.	n ? CMPD 8.	
ENTER	PV= CMPD 13852.248	
INT	INT= CMPD	

The following procedure should be performed when the display unit becomes difficult to read:

① Press the OFF key to turn the power of the unit OFF.
② Remove the battery compartment cover on the back of the unit after loosening the screw holding it in place.
③ Remove the old battery.
④ Press the reset button (RESET) on the front of the unit with a thin, pointed object for at least 4 seconds.
⑤ Wipe the surface of a new battery with a soft, dry cloth and load it into the compartment so that the positive pole (+) is facing upwards.
⑥ Replace the battery compartment cover and replace the screw while pressing down on the battery.
⑦ Press the AC key to turn power ON and then press the reset button again. Note that this operation will erase all data stored in the unit.



* If the operation in step ⑦ does not cause "0." to appear on the display, repeat steps ① through ⑦.

IMPORTANT: Keep batteries away from small children. Contact a physician immediately if inadvertently swallowed.

AUTO POWER OFF FUNCTION

- The unit switches off automatically if approximately 6 minutes elapse after the last key operation. Press the AC key to restore power switched off by this function.
- The data present in memory is retained unless the battery is exhausted or removed.

FINANCIAL CALCULATIONS

- Press one of the following keys to select the financial calculation to be performed.

  CMPD FV .....Principal + interest for compound interest calculations.
  CMPD PV .....Principal for compound interest calculations.
  INST FV .....Principal + interest for installment saving calculations.
  LOAN PMT .....Monthly payment for loan calculations.
  LOAN BNS .....Bonus payment for loan calculations.

* Arithmetic calculations can be performed during any financial calculation.

- After current selecting the desired calculation, the contents of each data item appear on the display in sequence each time ENTER is pressed.
- The entry for the interest rate prompt "i%?" should be performed in the percent unit. An error is generated when an interest rate of 0% is entered for installment savings or loan calculations.
- An error may be generated when a value generally not used for an interest rate is entered.
- The number of payment periods unit and interest rate should be entered as follows when performing compound interest and installment saving calculations:

NUMBER OF PERIODS	INTEREST RATE
Years	Annual
Months	Monthly
Days	Daily

- Annual interest rates only should be entered for loan calculations.
- Press the C or AC key to clear errors generated when a calculation result exceeds the maximum number of digits, but the financial calculation memory retains all values of the calculation being performed.
- To start a new financial calculation when data from the previous financial calculation is still present in memory, simply enter the new data. The previous data can also be cleared by pressing the C key.
- Pressing the AC key cancels the current mode.

COMPOUND INTEREST CALCULATIONS

Used to determine either the principal or the principal + interest.

- The results are calculated according to the following formulas.

Principal + interest

$$FV = PV\left(1+\frac{i}{100}\right)^{n}$$

Principal

$$PV = FV\left(1+\frac{i}{100}\right)^{-n} = \frac{FV}{\left(1+\frac{i}{100}\right)^{n}}$$

i : Interest rate (%) $i \geqq 0$
n : Period $0 \leqq n \leqq 499$ (n = integer)

2. Principal of compound interest calculation

Example: Interest: 4%, compounded quarterly
Period: 2 years
Target: $15,000
Object: Required principal

OPERATION	DISPLAY
CMPD PV	FV ? CMPD 0.
15000	FV ? CMPD 15000.
ENTER	i% ? CMPD 0.
4 ÷ 4 = * Divide the annual interest rate by 4 to compound quarterly.	i% ? CMPD 1.
ENTER	n ? CMPD 0.
2 × 4 = * Multiply the number of periods by 4.	n ? CMPD 8.
ENTER	PV= CMPD 13852.248
INT	INT= CMPD 1147.7516

Previous financial calculation data appears in place of "0." when present. The same is true for following operations when ENTER is pressed.

INSTALLMENT SAVING CALCULATIONS

Used to determine the total principal + interest for an installment savings account (installments paid in at beginning of period).

- The results are calculated according to the following formula.

Principal + interest

$$FV = PMT\cdot\left(1+\frac{i}{100}\right)\cdot\frac{\left(1+\frac{i}{100}\right)^{n}-1}{\frac{i}{100}}$$

i: Interest rate (%) $i > 0$
n: Period $0 \leqq n \leqq 499$ (n = integer)
PMT: Deposit amount

Example: Monthly deposit: $250
Interest: 6%, compounded monthly
Period: 5 years
Object: Principal + interest

OPERATION	DISPLAY
INST FV	PMT ? INST 0.
(Deposit amount) 250	PMT ? INST 250.
ENTER	i% ? INST 0.
(Interest rate) 6 ÷ 12 = * Divide by 12 for monthly compounding.	i% ? INST 0.5
ENTER	n ? INST 0.
5 × 12 = * Multiply the period by 12.	n ? INST 60.
ENTER	FV= INST 17529.719
INT	INT= INST 2529.7199

Previous financial calculation data appears in place of "0." when present. The same is true for following operations when ENTER is pressed.

LOAN CALCULATIONS

Used to determine the monthly installments (end of payment period) and the bonus payments due for loans.

- The results are calculated according to the following formulas.

Monthly payment

$$PMT = PV \frac{\frac{1}{12}\cdot\frac{i}{100}\left(1+\frac{1}{12}\cdot\frac{i}{100}\right)^{m}}{\left(1+\frac{1}{12}\cdot\frac{i}{100}\right)^{m}-1}$$

Bonus payment

$$BNS = PV \frac{\frac{6}{12}\cdot\frac{i}{100}\left(1+\frac{d}{12}\cdot\frac{i}{100}\right)\left(1+\frac{6}{12}\cdot\frac{i}{100}\right)^{K-1}}{\left(1+\frac{6}{12}\cdot\frac{i}{100}\right)^{K}-1}$$

i : Annual interest rate (%) $(i > 0)$
m : Number of monthly payments $(0 \leqq m \leqq 499)$ (m = integer)
k : Number of bonus payments $(0 \leqq k \leqq 499)$ (k = integer)
d : Number of months to first bonus payment $(d \geqq 0)$

Example: Loan amount: $100,000
Annual interest rate: 8.52%
Total amount of monthly payments: $60,000
Total amount of bonus payments: $40,000
Period: 18 years
Bonus cycle: Every 6 months from loan date
Object: Monthly payments and bonus payments

OPERATION	DISPLAY	
LOAN PMT	PV ? LOAN 0.	Previous financial calculation data appears in place of "0." when present. The same is true for following operations when ENTER is pressed.
60000	PV ? LOAN 60000.	
ENTER	i% ? LOAN 0.	
8.52	i% ? LOAN 8.52	
ENTER	m ? LOAN 0.	
18 × 12 = * Multiply period by 12.	m ? LOAN 216.	
ENTER	PMT= LOAN 544.01254	Monthly payment = $544.01254
INT	INT= LOAN −57506.71	Interest = $57,506.71
LOAN BNS	PV ? LOAN 60000.	Previous financial calculation data appears in place of "0." when present. The same is true for following operations when ENTER is pressed.
40000	PV ? LOAN 40000.	
ENTER	i% ? LOAN 8.52	Use the same interest rate.
ENTER	K ? LOAN 0.	
18 × 2 = * Multiply period by 2 for number of bonus payments.	K ? LOAN 36.	
ENTER	d ? LOAN 0.	
6 * Number of months to first bonus payment.	d ? LOAN 6.	
ENTER	BNS= LOAN 2192.2642	Single bonus payment = $2,192.2642
INT	INT= LOAN −38921.514	Interest = $38,921.514

TIME/DATE CALCULATIONS

TIME CALCULATIONS

HMS.....Decimal to hour/minute/second conversion.
HMS.....Hour/minute/second to decimal conversion.

<Calculation range>
−10,000 hours 00 minutes 00 seconds < calculation range < 10,000 hours 00 minutes 00 seconds

* Input outside of the range noted above is impossible.
* Calculation results outside of the calculation range result in an error (E).

Hour
Entering decimal values causes anything to the right of the decimal point to be treated as minutes and seconds.

Minute
Values greater than 60 result in the excess being converted to hours. Entering decimal values causes anything to the right of the decimal point to be treated as seconds.

Second

EXAMPLE	OPERATION	DISPLAY
How many days are there between October 20, 1985 and May 3, 1986?	1986 DATE 5 DATE 3 = * 20th century years can be entered using only the last two digits. 1985 DATE 10 DATE 20 =	86−05−03 195. (195 DAYS)
What is the date 200 days from November 30, 2001?	2001 DATE 11 DATE 30 + * 21st century years must be entered in full.	01 11 03 * Hyphens are not displayed between the year, month, and date for 21st century dates.
	200 =	02 06 18 (June 18, 2002)
(Constant calculation) What are the dates 50 days, 100 days, and 150 days from September 20, 1986?	86 DATE 9 DATE 20 + +	K 86−09−20
	50 =	K 86−11−09
	100 =	K 86−12−29
	150 =	K 87−02−17
(Memory calculation) What are the dates 15 days, 30 days, and 45 days before August 3, 1985?	C MC 85 DATE 8 DATE 3 M+	M 85−08−03
	− 15 =	M 85−07−19
	MR − 30 =	M 85−07−04
	MR − 45 =	M 85−06−19

CALCULATIONS

- Basic arithmetic calculations can be performed in any mode.
- Use the C or ► key to clear mis-entered values, and re-enter correctly. Each press of the ► key shifts the displayed value one digit to the right.
- Incorrect entry of an operator (+, −, ×, ÷) can be corrected by pressing the key corresponding to the correct operator.
- Pressing the AC (all clear) key cancels an entire entry.
- Pressing the MC (memory clear) key clears memory contents.
- The Kin key enters the number displayed into the constant memory. The Kout key recalls the constant without clearing it from memory.
  * When a new constant is entered into memory using the Kin key, the previous constant is replaced with the new one.
  * To clear a number in the constant memory, press AC Kin.
- Double entry of an operator (+, −, ×, ÷) makes the numeric value followed by the double entry a constant.
- Besides symbols for each operator, the following indicators also appear on the display:
  M: Numeric value in independent memory
  K: Constant calculation being performed
  E: Error condition
- The error condition is released by pressing the AC or C key.
- Calculations should be performed after first pressing the AC key.

	AC		0.
53 + 123 − 63 =	53 + 123 − 63 =		113.
963 × (23 − 56) =	23 − 56 × 963 =		−31779.
3 × (−12) + 20 =	3 × 12 +/− + 20 =		−16.
(56 × 3 − 89) ÷ 5.2 + 63 =	56 × 3 − 89 ÷ 5.2 + 63 =		78.192307
123456 × 741852 =	123456 × 741852 =		E 915.86080
	C		915.86080
	AC		0.
√3 × 5 =	3 √ × 5 =		8.660254
12 + 23 =	23 + + 12 =	K	35.
45 + 23 =	45 =	K	68.
78 + 23 =	78 =	K	101.
7 − 5.6 =	5.6 − − 7 =	K	1.4
2 − 5.6 =	2 =	K	−3.6
2.3 × 12 =	12 × × 2.3 =	K	27.6
4.5 × 12 =	4.5 =	K	54.
45 ÷ 9.6 =	9.6 ÷ ÷ 45 =	K	4.6875
78 ÷ 9.6 =	78 =	K	8.125
12% of 1500	1500 × 12 %		180.
Percentage of 660 against 880	660 ÷ 880 %		75.
15% add-on of 2500	2500 × 15 % +		2875.
25% discount of 3500	3500 × 25 % −		2625.
What will the selling price and profit be when the purchasing price of an item	480 + 25 %		640.

18 × 2 = Multiply period by 2 for number of bonus payments.	K ? LOAN 0.	
ENTER	K ? LOAN 36.	
6 * Number of months to first bonus payment.	d ? LOAN 0.	
ENTER	d ? LOAN 6.	
	BNS= LOAN 2192.2642	Single bonus payment = $2,192.2642
INT	INT= LOAN −38921.514	Interest = $38,921.514

TIME/DATE CALCULATIONS

TIME CALCULATIONS

HMS.....Decimal to hour/minute/second conversion.
HMS.....Hour/minute/second to decimal conversion.

<Calculation range>
– 10,000 hours 00 minutes 00 seconds < calculation range < 10,000 hours 00 minutes 00 seconds

* Input outside of the range noted above is impossible.
* Calculation results outside of the calculation range result in an error (E).

Hour
Entering decimal values causes anything to the right of the decimal point to be treated as minutes and seconds.

Minute
Values greater than 60 result in the excess being converted to hours. Entering decimal values causes anything to the right of the decimal point to be treated as seconds.

Second
Values greater than 60 result in the excess being converted to hours and minutes.

* Hour/minute/second input should be limited to six digits.
* The seconds digits are cut off when a calculation result exceeds six digits for hours/minutes/seconds.

EXAMPLE	OPERATION	DISPLAY
Display 12.345 hours in hour-minute-second format.	12.345 HMS	12°20°42. 12 hours, 20 minutes, 42 seconds
Display 119.5 minutes (111.1151 seconds) in hour-minute-second format.	C 0 HMS	0°0°0.
	119.5 HMS	1°59°30.
	111.1151 HMS	2°1°21.12
Display 12 hours, 34 minutes, 56 seconds in decimal format.	12 HMS 34 HMS 56 HMS	12°34°56.
	HMS	12.582222
	HMS	12°34°56.
Calculate (12 hours, 34 minutes, 56 seconds) + (30 minutes, 36 seconds)	12 HMS 34 HMS 56 HMS +	12°34°56.
	0 HMS 30 HMS 36 HMS =	13°5°32.

DATE CALCULATIONS

Date calculations in the range of 1901 through 2099 can be performed.

Press DATE after entry of each element (i.e. year DATE month DATE date DATE).

<Calculation range>
January 1, 1901 through December 31, 2099

* Dates outside of this range cannot be entered
* An error (E) is generated when a calculation result falls outside of this range.

* When a new constant is entered into memory using the Kin key, the previous constant is replaced with the new one.
* To clear a number in the constant memory, press AC Kin

- Double entry of an operator (+, −, ×, ÷) makes the numeric value followed by the double entry a constant.
- Besides symbols for each operator, the following indicators also appear on the display:
  M: Numeric value in independent memory
  K: Constant calculation being performed
  E: Error condition
- The error condition is released by pressing the AC or C key.
- Calculations should be performed after first pressing the AC key.

	AC		0.
53 + 123 − 63 =	53 + 123 − 63 =		113.
963 × (23 − 56) =	23 − 56 × 963 =		−31779.
3 × (−12) + 20 =	3 × 12 +/− + 20 =		−16.
(56 × 3 − 89) ÷ 5.2 + 63 =	56 × 3 − 89 ÷ 5.2 + 63 =		78.192307
123456 × 741852 =	123456 × 741852 =		E 915.86080
	C		915.86080
	AC		0.
√3 × 5 =	3 √ × 5 =		8.660254
12 + 23 =	23 + + 12 =	K	35.
45 + 23 =	45 =	K	68.
78 + 23 =	78 =	K	101.
7 − 5.6 =	5.6 − − 7 =	K	1.4
2 − 5.6 =	2 =	K	−3.6
2.3 × 12 =	12 × × 2.3 =	K	27.6
4.5 × 12 =	4.5 =	K	54.
45 ÷ 9.6 =	9.6 ÷ ÷ 45 =	K	4.6875
78 ÷ 9.6 =	78 =	K	8.125
12% of 1500	1500 × 12 %		180.
Percentage of 660 against 880	660 ÷ 880 %		75.
15% add-on of 2500	2500 × 15 % +		2875.
25% discount of 3500	3500 × 25 % −		2625.
What will the selling price and profit be when the purchasing price of an item is $480 and the profit rate to the selling price is 25%?	480 + 25 % −		640. 160.
What will the bargain price and loss be if a $130 item is sold at a loss rate of 4% of the bargain price?	130 + 4 +/− % −		125. −5.
If you made $80 last week and $100 this week, what is the percent increase?	100 − 80 %		25.
80 × 9 = 720 −) 50 × 6 = 300 20 × 3 = 60 480	MC 80 × 9 M+ 50 × 6 M− 20 × 3 M+ MR	M M M M	720. 300. 60. 480.
(7 × 8 − 9) / (3 + 5)	3 + 5 = Kon 7 × 8 − 9 ÷ Kon =		8. 5.875

SPECIFICATIONS

Model: BF-80

Basic calculation functions:
Addition/subtraction/multiplication/division, constants for +/−/×/÷, memory calculations, constant memory calculations, percentage calculations including mark-up/mark-down, square roots, sign changes, date calculations, time calculations, 16-digit approximate calculations, and other mixed calculations

Financial calculation function:
Compound interest calculations, installment saving calculations, loan calculations

Display/digits: 8-digit liquid crystal display

Main component: One-chip CMOS-LSI

Power supply: One lithium battery (CR2016).
Approximately 480 hours of continuous operation on type CR2016.

Auto power OFF: Approximately 6 minutes after last key operation

Power consumption: 0.0009W

Ambient temperature range: 0°C ~ 40°C (32°F ~ 104°F)

Dimensions: 8(H) × 142(W) × 109(D) mm
(3/8"(H) × 5 5/8"(W) × 4 1/4"(D)) .....Unfolded
12(H) × 69(W) × 109(D) mm
(1/2"(H) × 2 3/4"(W) × 4 1/4"(D)) .....Folded

Weight: 63g (2.2oz) (including battery)